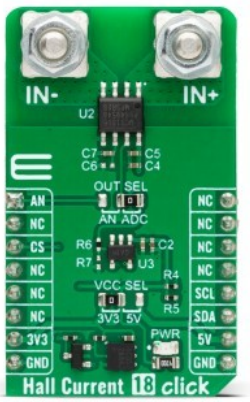
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Hall Current 18 Click





PID: MIKROE-5832

Hall Current 18 Click is a compact add-on board that contains a precise solution for AC/DC current sensing. This board features the MCS1806, an isolated Hall-effect current sensor from MPS. The sensor is immune to external magnetic fields via differential sensing and has no magnetic hysteresis. The MCS1806 features galvanic isolation between the pins of the primary conductive path and the sensor leads, allowing it to replace optoisolators and other isolation devices. This Click board™ makes the perfect solution for the development of multi-phase inverters, motor controls, automotive systems, load detection and management, and more.

Step Down 10 Click is fully compatible with the mikroBUS™ socket and can be used on any host system supporting the mikroBUS™ standard. It comes with the mikroSDK open-source libraries, offering unparalleled flexibility for evaluation and customization. What sets Hall Current 18 Click apart is the groundbreaking ClickID feature, enabling your host system to seamlessly and automatically detect and identify this add-on board.

.DO NOT TOUCH THE BOARD WHILE THE EXTERNAL POWER SUPPLY IS ON!

Note: This Click board™ needs to be used by trained personnel only while applying high voltages. Special care should be taken when working with hazardous voltage levels.

How does it work?

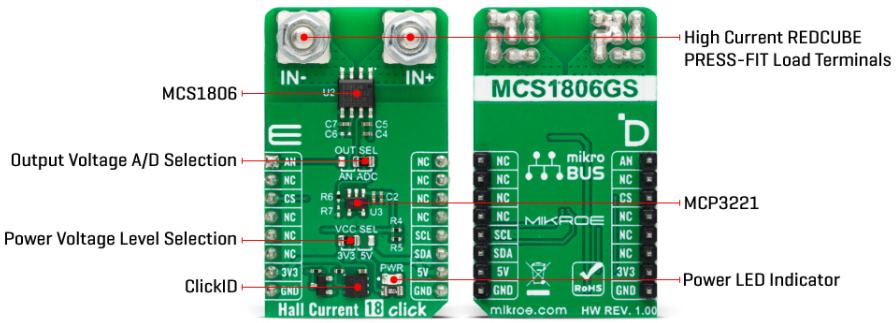
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Hall Current 18 Click is based on the MCS1806, an isolated Hall-effect current sensor from MPS. Its primary conductor has low resistance and allows current to flow close to the high-accuracy Hall-effect sensors. The current generates a magnetic field that is sensed at two different points by the integrated Hall-effect transducers. The difference in the magnetic field between those two points is converted into a voltage proportional to the applied current. As a low stable offset, a spinning current technique is used.



The MCS1806 outputs an analog signal, which on this board™ can be read in a digital form. For that purpose, Hall Current 18 Click features the MCP3221, a successive approximation A/D converter with a 12-bit resolution from Microchip. The onboard OUT SEL jumper allows you to choose between the analog and digital output of the sensor. The MCP3221 is selected by default. This Click board™ should be connected in series with the load. Two onboard terminal connectors measure the current, one terminal block for the positive and the other for the negative current input.

Hall Current 18 Click can use an analog output to allow the host MCU to read the data as analog values. In addition, over the MCP3221 and standard 2-Wire I2C interface, it can allow the host MCU to read data in a digital form and 12-bit resolution. Data can be transferred at rates of up to 100kbit/s in the Standard and 400kbit/s in the Fast Mode. Also, maximum sample rates of 22.3kSPS with the MCP3221 are possible in a Continuous-Conversion Mode with a clock rate of 400kHz.

This Click board™ can operate with either 3.3V or 5V logic voltage levels selected via the VCC SEL jumper. This way, both 3.3V and 5V capable MCUs can use the communication lines properly. Also, this Click board™ comes equipped with a library containing easy-to-use functions and an example code that can be used as a reference for further development.

Specifications

Type	Current sensor
Applications	Can be used for the development of multi-phase inverters, motor controls, automotive systems, load detection and management, and more
On-board modules	MCS1806- isolated Hall-effect current sensor from MPS

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Key Features	Immune to external magnetic fields via differential sensing, 3KVRMS minimum isolation voltage, good accuracy, adjustable bandwidth, output proportional to AC or DC currents, factory-trimmed accuracy, and more
Interface	I2C
ClickID	Yes
Compatibility	mikroBUS™
Click board size	M (42.9 x 25.4 mm)
Input Voltage	3.3V or 5V

Pinout diagram

This table shows how the pinout on Hall Current 18 Click corresponds to the pinout on the mikroBUS™ socket (the latter shown in the two middle columns).

Notes	Pin	mikroBUS				Pin	Notes
Analog Output	**AN**	1	AN	PWM	16	NC	
	NC	2	RST	INT	15	NC	
ID COMM	**CS**	3	CS	RX	14	NC	
	NC	4	SCK	TX	13	NC	
	NC	5	MISO	SCL	12	**SCL**	I2C Clock
	NC	6	MOSI	SDA	11	**SDA**	I2C Data
Power Supply	**3.3V**	7	3.3V	5V	10	**5V**	Power Supply
Ground	**GND**	8	GND	GND	9	**GND**	Ground

Onboard settings and indicators

Label	Name	Default	Description
LD1	PWR	-	Power LED Indicator
JP1	VCC SEL	Left	Logic Level Voltage Selection 3V3/5V: Left position 3V3, Right position 5V
JP2	OUT SEL	Right	Output Voltage A/D Selection AN/ADC: Left position AN, Right position ADC

Hall Current 18 Click electrical specifications

Description	Min	Typ	Max	Unit
Supply Voltage	3.3	-	5	V
Optimized Primary Current Range	-40	-	+40	A
Typical Sensitivity	-	33	-	mV/A

Software Support

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We provide a library for the Hall Current 18 Click as well as a demo application (example), developed using MIKROE compilers. The demo can run on all the main MIKROE development boards.

Package can be downloaded/installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on Mikroe github account.

Library Description

This library contains API for Hall Current 18 Click driver.

Key functions

- hallcurrent18_read_current Hall Current 18 read current function.
- hallcurrent18_read_voltage Hall Current 18 read voltage level function.
- hallcurrent18_read_raw_adc Hall Current 18 read raw ADC value function.

Example Description

This example demonstrates the use of Hall Current 18 Click board™ by reading and displaying the current measurements.

The full application code, and ready to use projects can be installed directly from NECTO Studio Package Manager (recommended), downloaded from our LibStock™ or found on Mikroe github account.

Other Mikroe Libraries used in the example:

- MikroSDK.Board
- MikroSDK.Log
- Click.HallCurrent18

Additional notes and informations

Depending on the development board you are using, you may need USB UART click, USB UART 2 Click or RS232 Click to connect to your PC, for development systems with no UART to USB interface available on the board. UART terminal is available in all MIKROE compilers.

mikroSDK

This Click board™ is supported with mikroSDK - MIKROE Software Development Kit. To ensure proper operation of mikroSDK compliant Click board™ demo applications, mikroSDK should be downloaded from the LibStock and installed for the compiler you are using.

For more information about mikroSDK, visit the official page.

Resources

mikroBUS™

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mikroSDK

Click board™ Catalog

Click Boards™

ClickID

Downloads

Hall Current 18 click 2D and 3D files

MCS1806 datasheet

MCP3221 datasheet

Hall Current 18 click schematic

Hall Current 18 click example on Libstock

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